Delta Smelt Culture Project

QUARTERLY REPORT*

Applicant:	Doroshov/Lindberg	Quarterly Budget				Annual Budget			
CALFED Project No:	B-81581								
Budget year:	FY 98-99								
Statement Quarter:	July 98-Dec98 *Note: 6 month period	Budget	Accrued Expenditures	Variance	**	Budget	Accrued Expenditures	Balance to Complete	**
Task 1: (Phase 1)	Physical improvements at site	59,243	60,000	757		65,826	60,000	5,826	
Schedule:	July - Dec 98								
Percent Work Complete Task1	90%								
Task 2:	Broodfish collection and maintenance, rotifer culture	24,804	22,186	2,618		99,214	22,186	76,398	
Schedule:	Nov - June 99								
Percent Work Complete Task2	20%								
Task 3:	Larval rearing	0	0	0		23,427	0	23,427	
Schedule:	April - June 99								
Percent Work Complete Task3	0%								
Task 4:	Post-larval field collection	0	0	0		6,403	0	6,403	
Schedule:	Jun-99								
Percent Work Complete Task4	0%								
Task 5:	Submit final report	0	0	0		0	0	0	
Schedule:	Oct-99								
Percent Work Complete Task5	0%								

* Note: this quarterly report covers a six month period, due to late reciept of contract monies in first quarter.

**Explanation of Budget Varia No significant budget variances

Explanation of Budget Variance will include a narrative description of reasons for each referenced variance from above table.
Explanations are required only for significant variances.

Total Project Costs Breakdown:

Funding from CALFED: 194,870

Project Schedule:

Phase 1 one year

Animal Science Department, UC -Davis, Davis CA, 95616

Quarterly Report

From: Drs. Joan Lindberg and Serge Doroshov.
925-443-2448; lindberg @ jps.net

To: Bay-Delta CALFED

Project: B81581, Delta Smelt Culture, State Water Project site - Byron
Date: 1/7/99

The objective of this project is to develop methods to culture the threatened fish, delta smelt. Numerous researchers are looking for a supply of smelt for basic and applied research, such as toxicology testing and improved fish screen design work. We are funded by CALFED for the first year of a three year grant. Emphasis in the first year is on improving the physical facilities at our site, optimizing spawn performance and larval culture procedures. Developing methods for the capture of post-larvae from the field for culture will be a minor emphasis this year.

This progress report briefly summarizes the progress from July 98 to present, 6 months. Previous culture work at this site has been funded by the Inter-agency Ecological Program.

I. Physical improvements at the site, and development of method to sterilize the delta water are our first priorities; July - December '98

We are nearing completion of the new laboratory (shipping container box) brought on site 3/98.

- Electrical wiring is completed - providing lighting and capacity to install the new water chilling unit recently purchased.
- The lab is plumbed with PVC pipe to provide water and drain lines to all tanks
- The container is partitioned to accommodate culture of the following life stages of delta smelt: eggs, larvae, and post-larvae to juvenile stages. Room has also been allocated for rotifer and brine shrimp cultures.

Creation of a sterile water supply was thought necessary after further review of last season's results with initial larval rearing trials. These preliminary rearing trials indicated that larvae reared with a supply of commercial drinking water did not exhibit the disease problems of the larvae reared with delta water. No clean water, such as well water, is available at the site. It is cost prohibitive to haul in water for larger scale rearing trials. We investigated two methods for sterilizing the delta water: batch chlorination and subsequent de-chlorination, or continuous ozonation of the delta water. We met with Professor Raul Piedrahita, aquaculture engineer UC-Davis, he advised us to adopt ozonation, and suggested we visit Bodega Marine Lab to see it in practice. After our visit and further reading we decided to adopt the ozone technology for our site. We are currently running some tests of the procedure. We are analyzing the delta water before and after ozonation to determine if it is effective in eliminating dissolved organics and bacteria. We will then determine the size of the ozone generator needed for our project.

Rearing trials with larvae will include use of both a sterile water supply that is a flow through water supply and a "mature" re-circulating water supply. A mature supply of water is an advantage with some larval species. Extensive sterilization of the water also offers a higher success rate with many species.

II. Collection and maintenance of broodfish, testing of larval systems, and initiation of rotifer culture are our next priorities; November '98 - February '99

Collection of broodstock was accomplished quickly in late October. With the assistance of California Department of Fish and Game's boat and personnel we netted 360 fish in four trips. Survival to date is 75%. We now have 272 adult broodfish and we are on target for the spring spawning season.

Maintenance of broodfish is a daily routine since capture. Tanks are siphoned and wiped down and fish fed. Dead fish are removed and weights and lengths recorded. Fish are treated as necessary with nitrofurazone and formalin to prevent spread of disease.

Inoculation of the recirculating water supply for larval rearing trials was done in mid-December to allow time for the bacteria to become established for the mature water supply. We will use two sizes of larval tanks to test for effect of tank size on rearing outcome and we will test the effect of two water supplies. We are currently assembling all the tanks and will run preliminary tests with the only algae to determine clearance times prior to the spawning season. The egg incubators have been repaired from last year and the troughs and stand to hold them are in place in teh new lab. We are developing a volumetric method for estimating egg number vs. counting each egg. This will greatly reduce egg handling time over last year's method.

Rotifer culture will be purchased by the first week of February to allow two months to establish a large stable culture prior to feed-out . Target culture production is 15 million rotifers/day. We are investigating new diet supplements for rotifers and brine shrimp that can enhance larval fish survival; and have met with the suppliers of a cryo-preserved micro-algae and with a fish culturist at the Monterey Bay Aquarium.